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Superexchange interactions and magnetic microstructures of oxyfluoride ferrospinels

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Abstract

A Mössbauer study has been performed on a series of oxyfluoride ferrites based on nickel ferrite. Anion substitution results in new magnetically nonequivalent positions for the iron ions, which are characterized by lower local magnetic fields at the nucleus. The ratios between the different types of cations affect the cation distribution in the octahedral positions. The Néel temperatures calculated in this way describe the experimental values satisfactorily and indicate that the fluorine weakens the superexchange interaction between sublattices, which is confirmed also by the temperature dependence of the local magnetic fields at the iron ions with different anionic environments. © 1985 Plenum Publishing Corporation.

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